FORM 1 - Mix Design Submittal

Project Number: STP-0014-00(014)/106193701

Project Description: Coahoma County

Constructor: AMG Construction, Inc

Concrete Supplier: MMC Materials

Mix Number: D3710215
MDOT Mix ID
Specified Slump: 4 inches

Specified Compressive Strength: 3500 psi

Specified Air Content 3 - 6 %
Target Air Content 4.5 %

Required Average strength, f'_{cr} *(check the appropriate box)*

	Based on Field Experience of Trial Mixtures (Supporting data must be attached)	psi
X	Based on Laboratory Trial Mixtures (Supporting data must be attached)	5320 psi

Material Porperties and Source

Cementitious Material		Type		Source		Specific Gravity
Portland Cement		II		Buzzi	Festus	3.15
Fly Ash		C		Headwater	Newark	2.65
GGBFS (Slag)		Grade 100		Grancem		2.69

Admixtures		Name		Supplier		Dosage, oz, cwt
AEA		MB AE 90		BASF		.25 - 4.0
Type A		322N		BASF		3.0
Note: Dosage rate will require adjustments for field and environmental conditions.						

Aggregate Size	Type	Aggr. #	Sp. Gr. SSD	Sp. Gr. OD	Absorption, %	F.M.	DOT Source #
#57	Rock	Rockco	2.58	2.54	1.58	7.05	2-54-39
#8	Rock		2.50	2.41	3.73		
Sand	Natural	Rockco	2.63	2.61	0.91	2.78	2-54-39

Water: Local Water Association

Material	Quantities lb/yd³ SSD	Absolute Volume yd³		Quantities lb/yd³ Oven-Dry	Absolute Volume yd³
Cement, lb.	564	2.87		564	2.87
Fly Ash, lb	0	0.00		0	0.00
Mix Water, lb.	250	4.01		250	4.01
Slag, lb.	0	0.00		0	0.00
Coarse Aggr., lb. 1	1700	10.56		1673	10.56
Coarse Aggr., lb. 2	0	0.00			
Fine Aggr., lb.	1370	8.35		1360	8.35
Air Content, %	4.5	1.22		4.5	1.22
Total Mass, lb.	3884	27.00		3852	27.00

Mix Design Information:

Mix Class Class B
Comments: With Coloring

Temperature Control EXCLUDED

Mix Revision Number: 0
Organization: MMC Materials

Water / cementitious material ratio: 0.44
Water - Gallons/Yard 30.0
MB AE 90 3%-6% Air Range
322N 16.9 oz/yard

Omaha Tan Coloring 6 lbs per yard

The above mix will meet the specified strength in 28 days when tested, placed and handled in accordance with current ASTM and ACI standards and recommended practices. Please include this office on the distribution list for all concrete test reports.

Designed by: Carl Edwards Title: Delta QC Director Date: 11/19/2015

Greenville Area

Customer: **AMG Construction,** Project **STP-0014-00(014)** Lab #: **1**

Plant: **Lab** Notes: **Class B** Set #: **46**

Date: **5/21/2015** Mix Code: **D3710215** f'c: **3500** Size(c.f.): **1.50** Factor: **0.06**

Material	Vol. (c.f.)	SSD mix 1 cu. yd. Wt. (lbs.)	SSD mix lab batch Wt. (lbs.)	Adjusted lab batch Wt. (lbs.)	Actual lab batch Wt. (lbs.)		SSD Specific Gravity	Agg Absorption	Agg. FM
Cement:	2.87	564	**31.3**	**31.3**	31.3	**Buzzi Festus**	3.15		
Fly Ash:	0.00	0	**0.0**	**0.0**			2.65		
Sand #1:	8.35	1370	**76.1**	**78.5**	78.5	**Rockco 2-54-39**	2.63	0.91%	2.78
Sand #2:	0.00	0	**0.0**	**0.0**			0.00		
Coarse agg	10.56	1700	**94.4**	**93.9**	93.9	**Rockco 2-54-39**	2.58	1.58%	7.05
Air: **4.50%**	1.22	0							
Water:	4.01	250	**13.9**	**12.1**	12.1	**City**	1.00		
GGBFS	0.00	0	**0.0**	**0.0**			2.86		
Other:									
Total:	27.00	3884							

ADMIX INFORMATION

Type	oz /cwt	oz /cy	ml /cy	batch ml	actual ml	Brand / Name
Air	0.45	2.5	75.1	4.2	4	AE 90
Type A	3.0	16.9	500.4	27.8	28	322N
		0.0	0.0	0.0		
Other	0.0	0.0	0.0	0.0		

PLASTIC TEST RESULTS

Batch Time	**9.35am**	% Air	**6.50**
Sample Time	**9.49am**	Unit Weight (pcf)	**141.60**
Slump	**4.5**	Yield	**1.52**
Mix Temp.	**75**	Initial set, min.	
Air Temp.	**73**	Final set, min.	

OTHER INFO

Des. w/c	0.44
Act. w/c	0.45
Des.Un.Wt.	143.85
Sand/Agg.	0.81
Bag Factor	6.0

Aggregate Moistures

	Free h2o Content	Batch free h2o (lbs.)
Sand #1:	3.17%	2.4
Sand #2:	0.00%	0.0
Coarse	-0.60%	-0.6

Water Added/Withheld

+/- h2o	Added	W/held
0.0	0.0	0.00

Comments / Notes / Observations

Strength Test Results

Date	AGE 4x8 CYLINDERS	psi	Avg. psi
05/24/15	3	4457	
05/24/15	3	4083	4078
05/24/15	3	3693	
05/28/15	7	4340	
05/28/15	7	4650	4529
05/28/15	7	4597	
06/18/15	28	5427	
06/18/15	28	5476	5320
06/18/15	28	5057	
			0

Technician who conducted tests: Carl Edwards

Omaha Tan Coloring Added 133 lbs

CONTINENTAL CEMENT

Cement Mill Test Report

Month of Issue: November-2015

Plant: Buzzi Unicem - Festus, MO

Product: Portland Cement Type I/II Low Alkali

Manufactured: October-15

ASTM C150 and AASHTO M 85 Standard Requirements

CHEMICAL ANALYSIS

Item	Spec limit	Test Result
Rapid Method, X-Ray		
SiO2 (%)	---	19.2
Al2O3 (%)	6.0 max	5.0
Fe2O3 (%)	6.0 max	3.7
CaO (%)	---	62.8
MgO (%)	6.0 max	2.5
SO3 (%)	3.0 max *	3.2
Loss on ignition (%)	3.0 max	2.7
Insoluble residue (%)	0.75 max	0.19
CO2 (%)	---	1.62
Limestone (%)	5.0 max	3.8
CaCO3 in Limestone (%)	70 min	98
Adjusted Potential Phase Composition		
C3S (%)	---	55
C2S (%)	---	14
C3A (%)	8 max	7
C4AF (%)	---	11
C3S+4.75*C3A (%)	100 max	87

PHYSICAL ANALYSIS

Item	Spec limit	Test Result
Blaine Fineness (m2/kg)	280 - 430	383
Autoclave expansion (%)	0.80 max	0.04
Time of setting (minutes)		
Vicat Initial	45 - 375	100
Air content of mortar (%)	12 max	8
Compressive strength (MPa, [PSI])		
1 day	---	14.9 [2160]
3 days	12.0 [1740] min	24.0 [3480]
7 days	19.0 [2760] min	32.3 [4680]
Mortar Bar Expansion (%) (C 1038)*	---	0.0003

ASTM C 150 and AASHTO M 85 Optional Chemical Requirements:		
NaEq (%)	0.60 max	0.45

* May exceed 3.0% SO3 maximum based on C1038 results of <0.02% expansion at 14 days.

Buzzi Unicem has certified to Continental Cement Company, LLC that at the time of shipment from their Festus, MO facility the cement described above meets the chemical and physical requirements of ASTM C150, AASHTO M85, or ASTM C91 (as tested and reported by Buzzi Unicem). The data presented represents the average for the cement produced for the month as indicated above.

Adam Oliver

Adam Oliver - Quality Manager
Davenport Plant - (563) 328-6207
11/16/2015

BASF

The Chemical Company

October 28, 2015

MMC Materials, Inc
1117 South Raceway Road
Greenville, MS 38704

Attention: Carl Edwards
Project: Any
Project location: Any

Certificate of Conformance
MasterAir® AE 90 Admixture (formerly MB-AE 90)
BASF Corporation Air-Entraining Admixture for Concrete"

I, Richard Hubbard, Sr. Technical Marketing Specialist for BASF Corporation, Cleveland, Ohio, certify:
That MasterAir AE 90 admixture is a BASF Corporation Air-Entraining Admixture for concrete; and
That MasterAir AE 90 and MB AE 90 admixture are the same product having identical composition, differing only in designation; and
That no calcium chloride or chloride based ingredient is used in the manufacture of MasterAir AE 90 admixture; and
That MasterAir AE 90 admixture, based on the chlorides originating from all the ingredients used in its manufacture, contributes less than 0.000068 percent (0.68 ppm) chloride ions by weight of the cement when used at the rate of 65 mL per 100 kg (1 fluid ounce per 100 pounds) of cement; and
That MasterAir AE 90 admixture meets the requirements of ASTM C260, the Standard Specification for Air-Entraining Admixtures for Concrete, as well as the requirements for air-entraining admixtures as specified in Corps of Engineers' CRD-C 13 and AASHTO M154.

Richard Hubbard III

Richard Hubbard
Sr. Technical Marketing Specialist

BASF Corporation
Admixtures Systems
23700 Chagrin Boulevard
Cleveland, Ohio 44122
Telephone (216) 839-7500

MASTER® BUILDERS SOLUTIONS

BASF

The Chemical Company

October 28, 2015

MMC Materials, Inc
1117 South Raceway Road
Greenville, MS 38704

Attention: Carl Edwards
Project: Any
Project location: Any

Certificate of Conformance
MasterPozzolith® 322 Admixture (formerly Pozzolith 322N)
BASF Corporation Admixture for Concrete

I, Richard Hubbard, Sr. Technical Marketing Specialist for BASF Corporation, Cleveland, Ohio, certify:
That MasterPozzolith 322 admixture is a BASF Corporation Water-Reducing Admixture for concrete; and
That MasterPozzolith 322 and Pozzolith 322N admixture are the same product having identical composition, differing only in designation; and
That no calcium chloride or chloride based ingredient is used in the manufacture of MasterPozzolith 322 admixture; and
That MasterPozzolith 322 admixture, based on the chlorides originating from all the ingredients used in its manufacture, contributes less than 0.00024 percent (2.4 ppm) chloride ions by weight of the cement when used at the rate of 65 mL per 100 kg (1 fluid ounce per 100 pounds) of cement; and
That MasterPozzolith 322 admixture meets the requirements for a Type A, Water Reducing, Type B, Retarding, and Type D, Water Reducing and Retarding Admixture specified in ASTM C494/C494M and AASHTO M194, the Standard Specification for Chemical Admixtures for Concrete, as well as the requirements for Type A, Type B and Type D admixtures as specified in Corps of Engineers' CRD-C 87.

Richard Hubbard III

Richard Hubbard
Sr. Technical Marketing Specialist

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23700 Chagrin Boulevard
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MASTER® BUILDERS SOLUTIONS

MIX-IN COLORS FOR CONCRETE

Uses: Davis Colors are used in cast-in-place, slab-on-grade, precast, tilt-up and decorative concrete; shotcrete, mortar, concrete masonry units, pavers, retaining wall units and rooftile. They can also be used to color cast stone, plaster, stucco and other cement-based construction materials. Designed for mix-in use only, they should not be sprinkled or dusted onto the concrete surface.

Ingredients: Pure, concentrated pigments made of high-quality metal oxides recycled from iron or refined from the earth and specially processed for mixing into concrete. Davis Colors comply with ASTM C979 *Pigments for Integrally Colored Concrete.* They are lightfast, alkali-resistant, weather-resistant, durable and long-lasting like concrete. Davis Colors are available in a wide spectrum of standard colors and can be custom formulated to match design requirements. * Unlike other Davis Colors, Supra-Instant® black #8084 is a specially treated carbon black. Carbon black is the highest in tint strength and the most economical, but can fade if concrete is not sealed against water penetration. Sealing and periodic re-sealing can minimize this effect.

Packaging: Concrete suppliers use our Mix-Ready® disintegrating bags or Chameleon® bulk handling system. The Chameleon® is a computer-controlled automatic color dosing system used by concrete producers. Mix-Ready® bags are tossed into the mix without opening or pouring. They disintegrate under mixing action, releasing pigments to disperse uniformly leaving no bags to litter the environment.

Installation: Integrally colored concrete is installed the same way as high quality uncolored concrete. Choose a color on the inside of this color card and specify it by name and color number. Create a custom color by varying the amount of color added to the mix. Confirm desired color with a fully-cured job-site test panel. Dry color dose rates range from 1/2 to 7 lbs. per 94 lbs. of cement content and should never exceed 10% of cement content. (Liquid dose rates are higher). Cement content includes portland cement, fly ash, silica fume, lime and other cementitious materials but does not include aggregate or sand. Davis Colors have been used successfully in a wide variety of mix designs and are compatible with commercially available admixtures. The only known incompatibility is with calcium chloride set accelerator which causes blotching and discoloration. * Supra-Instant® black #8084 reduces or negates the effect of air-entraining admixtures.

Finishes: Paving and floors can be finished with pattern-stamped, broomed, troweled, exposed aggregate, salt-finished, sand-blasted, diamond-polishing or many other visually appealing textures. Cast-in-place, precast and tilt-up structures can be textured with sand-blasting, bushhammering, grinding, polishing, special forms or form liners. The combinations and possibilities are endless. Here are just a few:


Exposed Aggregate


Light Broom (wavy)


Stamped/ Patterned


Salt Finish


Sand Blasted


Form Liner

Curing & Sealing: W-1000 Clear™ is a non-clouding, spray-on cure and sealer that meets or exceeds ASTM C309 standards and is specially formulated for colored concrete and exposed aggregate finishes. Other curing methods, such as water curing or plastic sheets cause discoloration. Color Seal™ is an optional, thin-film sealer that's tinted to match the shades on this Color Selector. When applied over colored concrete or the W-1000 Clear™, it provides a more uniform appearance.

Quality Tips: For best results; materials, curing, weather conditions and workmanship should be uniform throughout a project. Quality starts with the concrete mix; use a low water-content, high-performance mix design. When planning a project, budget for craftsmanship.

Consumer Advice: Contractors are independently owned and operated without affiliation to Davis Colors. Choose a licensed and qualified contractor who provides written information and example projects you can see before you buy. Check the yellow pages, ask your local ready mix or building material dealer or visit www.concreteconnection.com to find contractors who specialize in colored concrete.

Specify Davis: Choose a color from this color selector and specify it by name and color number. Add color call-out to plan documents or specifications. For complete architectural and guide spec information, visit our web site, refer to our architectural binder, call, fax or write. Our guide specifications can be found in SweetSource®, Spec-Data®, ARCAT/Spec-Disk® or at www.daviscolors.com/specs.

Mixing Guide:

Use the same pigment-to-cement ratio, type and brand of cement and aggregates throughout project. Changes in cement and aggregate color affect final color.

Keep slump less than 5" (12.5 cm) and water content consistent. High water content causes concrete to appear pale or "faded". If higher slump is required, use a water reducing admixture instead of added water.

Calcium Chloride set-accelerator causes discoloration; Do not use with color.

Specify air content of 5% to 7% for improved workability and long term durability in freeze/thaw climates.

Schedule loads for consistent mix times. Deliver and discharge in less than 1-1/2 hours. Clean mixer thoroughly between color change-overs.

Confirm color number and weight in Mix-Ready® bag (or combination of bags) is the same required by mix design.

Wet mixer with 1/2 to 2/3 total batch water. Toss in Mix-Ready® bags and mix at charging speed for at least one minute. Add cement, aggregate and remaining batch water. Continue mixing at charging speed for at least 5 minutes (7 minutes for pea-gravel mixes).

Notice: In mixes with small aggregate or batches with short mixing duration, Mix-Ready® bags may not completely disintegrate. In sand-blasted or exposed aggregate finishes, use small bag sizes (15 lbs. maximum) or open bag and pour color normally.

The Chameleon® is a computer-controlled color dosing system for Ready Mix operators exclusively from Davis. It improves color accuracy and availability. Chameleon® dose rates differ from the rates on front of this card. For more information, go to www.daviscolors.com/chameleon.

Contractor's Guide:

Prepare a well-drained subgrade. Add a 2 to 3 inch (50 to 75 mm) layer of sand, gravel or crushed stone. Uniformly compact the subgrade and moisten evenly, leaving no puddles, standing water, ice, frost, or muddy areas.

If vapor barrier is used, overlap sheets and tape over holes in barrier. Place a 3" (75mm) layer of granular self-draining compactible fill over the barrier to minimize shrinkage cracking.

Position forms for uniform slab thickness. Follow American Concrete Institute standards for reinforcement and joint placement to control cracking.

Allow ample time and manpower for placement and finish work. Finish evenly and with care.

Begin troweling after bleed water evaporates. Late or hard troweling and edging causes "burns" or dark spots.

Water added at job-site to mixer or pumps will cause color to pale. Keep additions to a minimum and consistent among loads. Don't wet finishing tools or brooms or sprinkle water on the surface.

Do not sprinkle pigment or cement onto the surface.

Rotary, dry-broom, pattern stamped or rough finishes usually cure more even-colored than smooth-troweled finishes.

Uneven curing=uneven drying=uneven color. Cure colored concrete with Davis W-1000 Clear™ cure and seal. (info at: www.daviscolors.com/literature)

Do not use plastic sheets, water curing or curing products which discolor. Wood and other objects left on curing concrete cause discoloration.

Efflorescence is a white powdery substance that appears on concrete surfaces. A result of water evaporation, it is more noticeable on colored surfaces making them look faded or lighter in color when not cleaned off. Proper curing and protection against water penetration reduces tendency for efflorescence to occur. Remove with detergent or mild-acid cleaners formulated to remove efflorescence. Follow cleaner instructions and test in a small area to make sure cleaner will not etch or discolor the surface. Wear rubber gloves and eye protection.

For samples or additional information contact:

DAVIS COLORS

Tel: 800-356-4848
Fax: 323-269-1053
www.daviscolors.com

Starkville Laboratory
PO Box 1347
Starkville, MS 39760

Starkville Laboratory
217 Industrial Park Road
Starkville, MS 39759

Phone: 662.324.9372
Fax: 662.323.1299

Material	#57 Gravel
SOURCE & Pit #:	Rockco Mining LLC 2-54-39
SAMPLES FROM:	Plant Stock Pile
FOR USE AT:	Clarksdale

Date Sampled:	11/02/15
Date Tested:	11/04/15
SAMPLED BY:	CE
TESTED BY:	CE

Sample Weight **10244.9g**

GRADATION PASS OR FAIL **Pass**

SIEVE in	SIEVE mm	IND. WT RET (g)	CUM. WT RET (g)	TOTAL % RET.	TOTAL % PASS	MDOT SPECIFICATIONS		SIEVE in	Overloaded
2.50	63.00			0.0%	100.0%				
2.00	50.00			0.0%	100.0%				
1.50	37.50			0.0%	100.0%	100%		1.50	
1.25	31.50			0.0%	100.0%			1.25	
1.00	25.00	769.1	769.1	7.5%	92.5%	80% - 100%		1.00	
0.75	19.00	2449.9	3219.0	31.4%	68.6%			0.75	
0.50	12.50	3194.8	6413.8	62.6%	37.4%	25% - 60%		0.50	
0.38	9.50	1478.2	7892.0	77.0%	23.0%			0.38	
NO.4	4.75	2019.5	9911.5	96.7%	3.3%	0% - 10%		NO.4	
NO.8	2.36	290.1	10201.6	99.6%	0.4%	0% - 5%		NO.8	
PAN		40.0	10241.6	100.0%				PAN	
Total Retained			10241.6g						

Total Amount within 0.3% or 30.73g	Yes	
Sieve Overloaded?	OK	

FINENESS MODULUS (F.M.)

F.M.	7.05
Pit Base F.M.	
Within Tolerance	

SPECIFIC GRAVITY

APPARENT SPECIFIC GRAVITY	2.649
BULK DRY SPECIFIC GRAVITY	2.543
BULK SSD SPECIFIC GRAVITY	2.583
ABSORPTION %	1.58%

SPECIFIC GRAVITY WEIGHTS

SATURATED WT. IN WATER	3042.8
SSD AIR WEIGHT	4964.8
OVEN DRY WEIGHT	4887.5

PREPARED BY:
Carl Edwards

DATE: November 4, 2015

Starkville Laboratory
PO Box 1347
Starkville, MS 39760

Starkville Laboratory
217 Industrial Drive
Starkville, MS 39759

Phone: 662.324.9372
Fax: 662.323.1299

Material	Fine Aggregate
SOURCE & Pit #:	Rockco Mining LLC 2-54-39
SAMPLES FROM:	Plant Stock Piles
FOR USE AT:	Clarksdale

Date Sampled:	11/02/15
Date Tested:	11/04/15
SAMPLED BY:	CE
TESTED BY:	CE

Sample Weight **364.10g**

GRADATION PASS OR FAIL **Pass**

SIEVE in	SIEVE mm	IND. WT RET (g)	CUM. WT RET (g)	TOTAL % RET.	TOTAL % PASS	ASTM C33 SPECIFICATIONS		SIEVE in	INDIVIDUAL WT. RETAINED
0.50	12.50			0.0%	100.0%				
0.38	9.50	0.00	0.00	0.0%	100.0%	100%		0.38	
NO.4	4.75	12.00	12.00	3.3%	96.7%	95% - 100%		NO.4	
NO.8	2.36	34.80	46.80	12.9%	87.1%	80% - 100%		NO.8	
NO.16	1.18	41.10	87.90	24.1%	75.9%	50% - 85%		NO.16	
NO.30	600-um	81.30	169.20	46.5%	53.5%	25% - 60%		NO.30	
NO.40	425-um	93.20	262.40	72.1%	27.9%			NO.40	
NO.50	300-um	71.60	334.00	91.7%	8.3%	5% - 30%		NO.50	
NO.100	150-um	29.10	363.10	99.7%	0.3%	0% - 10%		NO.100	
PAN		0.90	364.00	100.0%				PAN	
Total Retained			364.00g						

Total Amount within 0.3% or 1.09g	Yes	
Sieve Overloaded if individual amount retained greater than 200 g.	OK	

FINENESS MODULUS (F.M.)

F.M.	2.78
Pit Base F.M.	
Within Tolerance	

Sand Equivalency (ASTM D2419)

Trial#	Sand Reading	Clay Reading
1		
2		
Sand Equivalency		

ORGANICS COLOR No.

CLEAR

SPECIFIC GRAVITY WEIGHTS

WT. PYC. W/WATER	1000.10
SSD WT.	511.90
WT. PYC. SAMPLE	1317.40
OVEN DRY WT.	507.30

SPECIFIC GRAVITY

APPARENT SPECIFIC GRAVITY	2.670
BULK DRY SPECIFIC GRAVITY	2.608
BULK SSD SPECIFIC GRAVITY	2.631
ABSORPTION %	0.91%

PREPARED BY:
Carl Edwards

DATE: